Type 5857 Electric Actuator

Three-step version · Version with digital positioner

SAMSON 5857
Electric Actuator
with digital positioner
F: 300 N s: 6 mm In: 0 - 10 V U: 24 V AC / DC P: 6 VA
Var. - ID. 1865818
Firmware - Version: 1.00
Serial - No. 0517 000001
Made in Germany

Mounting and Operating Instructions

EB 5857 EN

Firmware version 1.04

Edition April 2015

Note on these mounting and operating instructions

These mounting and operating instructions (EB) assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices.

➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

➔ If you have any questions about these instructions, contact SAMSON's After-sales Service Department (aftersalesservice@samson.de).

Referenced documentation

The documents for the devices used in combination with the electric actuator apply in addition to these mounting and operating instructions.

The mounting and operating instructions for all supplied devices are included in the delivery. The latest versions of the documents are available on our website at ▶ www.samson.de (Product documentation).

Definition of signal words

DANGER!
Hazardous situations which, if not avoided, will result in death or serious injury

WARNING!
Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE
Property damage message or malfunction

Note:
Additional information

Tip:
Recommended action

1 General safety instructions 5

2 Design and principle of operation 6

2.1 Technical data 7

3 Attachment to the valve 8

3.1 Mounting position 8

4 Electrical connection 9

5 Start-up 10

6 Manual override 11

7 Dimensions in mm 12

8 Actuator with digital positioner 13

8.1 Operating elements 13
8.1.1 LED blinking pattern 14
8.1.2 Operating direction switch 18
8.1.3 Initialization button 19
8.1.4 Starting initialization 19
8.1.5 Serial interface 19

9 Configuration and operation using the TROVIS-VIEW software 20

9.1 General 20
9.1.1 System requirements 20
9.2 Installing the software 21
9.3 Starting and setting the software 21
9.4 Setting parameters in TROVIS-VIEW 23
9.4.1 Changing settings 23
9.5 Inputs and outputs 25
9.5.1 Input signal 25
9.5.2 Position feedback signal 26
9.6 Actuator 26
9.6.1 Functions (actuator) 26
9.6.2 Blockage 28
9.6.3 Travel 29
9.6.4 Characteristic 32
9.7 Operating values 35
9.8 Service 36

9.8.1	Start-up	36
9.8.2	Operating states	37
9.8.3	Service/Functions	38
9.8.4	Status messages	40
9.8.5	Statistics	41
9.9	Trend-Viewer	42
9.9.1	Settings	42
10	**Data transmission**	**44**
10.1	Data transmission between TROVIS-VIEW and the actuator (connecting cable)	45
10.1.1	Offline mode (indirect data transmission)	46
10.1.2	Online mode (direct data transmission)	46
10.2	SAMSON memory pen	47
10.2.1	Data transmission between TROVIS-VIEW and memory pen	49
10.2.2	Data transmission between the actuator and memory pen	50
10.2.3	Copying function	51
10.2.4	Data logging	51
10.2.5	Configuring the command mode	53
11	**Appendix**	**54**
11.1	Configuration list	54
11.2	Nameplate	55
11.3	Customer inquiries	55

Note:
The sections with gray background apply to the actuator version with digital positioner. Only the sections 1 to 7, 11.2 and 11.3 are relevant for the three-step version of the actuator.

Firmware revisions	
1.00 (old)	**Up to 1.04** (new)
	Internal revisions

1 General safety instructions

For your own safety, follow these instructions concerning the mounting, start up and operation of the actuator:

– The actuator is to be mounted, started up or operated only by trained and experienced personnel familiar with the product. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
– Any hazards that could be caused in the valve by the process medium and the operating pressure or by moving parts are to be prevented by taking appropriate precautions.
– The actuator is designed for use in low voltage installations. For wiring and maintenance, you are required to observe the relevant safety regulations. Only use protective equipment in which the power supply cannot be reconnected inadvertently.
– Before wiring the actuator, disconnect it from the power supply.

To avoid damage to any equipment, the following also applies:

– Proper shipping and storage are assumed.

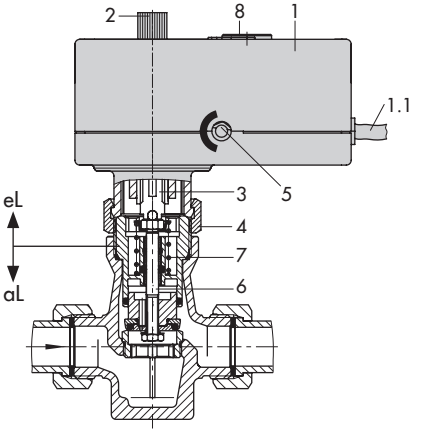
Note:
Devices with a CE marking fulfill the requirements of the Directives 2004/108/EC and 2006/95/EC. The Declaration of Conformity is available on request.

2 Design and principle of operation

The three-step version of the electric actuator consists of a reversible synchronous motor and a maintenance-free gear.

In the version with digital positioner, a stepper motor allows for supply by frequency-independent voltages.

The actuator is connected to the valve by a coupling nut (4) which provides a force-locking connection between the actuator stem and the plug stem of the valve.



1	Actuator	7	Valve spring
1.1	Cable	8	Cover [1] (serial interface, operating direction switch, initialization button and LEDs)
2	Handwheel		
3	Actuator stem		
4	Coupling nut		
5	Travel indicator		
6	Plug stem		

[1] Version with digital positioner only:

Fig. 1: *Valve with actuator*

The control signal from the input side is transferred over the motor and the connected gear and used as the positioning force to move the actuator stem.

When the actuator stem (3) extends, the valve is closed, opposing the force of the valve spring (7). When the actuator stem retracts, the valve is opened as the plug stem (6) follows the motion of the return spring.

The motor is switched off by torque-dependent limit switches when an end position is reached or in case the motor is overloaded.

The valve can be moved to any position in the de-energized state by the handwheel (2).

Travel and direction of action can be read off the travel indicator (5) on the side of the actuator housing.

The Type 5857 Actuator can be combined preferably with SAMSON Types 3222, 3222 N, 3267, 2488 and 2488 N Valves as well as special versions of Type 3260 and Type 3226 Valves.

Additional electrical equipment

The actuator is available with a digital positioner.

The positioner ensures a predetermined assignment of the valve position to the input signal.

A 0 to 10 V signal can be picked up at the brown (**BN**) and green (**GN**) wires for position feedback.

The version with positioner allows the characteristic to be reversed and is suitable for split-range operation.

2.1 Technical data

Type 5857 Actuator Version	**Three-step**	**With digital positioner**
Connection to valve	Force-locking	
Rated travel	6 mm	
Transit time for rated travel	20 s	30/**20** [1]/10 s
Stroking speed	0.3 mm/s	0.2/**0.3** [1]/0.55 mm/s
Thrust	300 N	
Power supply	230 V (±10 %), 50 Hz 24 V (±10 %), 50 Hz	24 V (±10 %), 50 Hz, 60 Hz and DC [2]
Power consumption	Approx. 3 VA	5 VA
Manual override	Yes	
Permissible temperatures		
Ambient	0 to 50 °C	
Storage	–20 to +70 °C	
Max. medium temperature	0 to 120 °C	
Degree of protection	IP 42 according to EN 60529	
Class of protection	II according to EN 61140	
Electromagnetic compatibility	According to EN 61000-6-2, EN 61000-6-3 and EN 61326	
Compliance	CE · EAC	
Weight	Approx. 0.7 kg	
Digital positioner		
Input signal	–	0 to 10 V [1], R_i = 20 kΩ
Position feedback (output signal)		0 to 10 V [1], R_B = 1 kΩ
Characteristic		Linear [1], equal percentage, reverse equal percentage, user-defined

1) Default setting
2) 10 s applies to 24 V DC (–0 %, +10 %) for Transit time for rated travel setting

3 Attachment to the valve

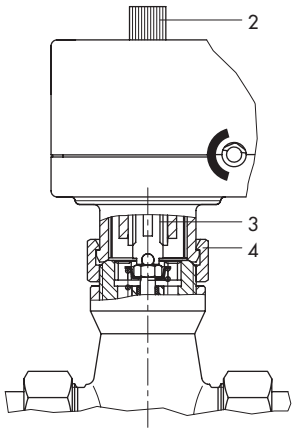
The actuator is connected to the valve with a coupling nut in the de-energized state (Fig. 2).

Turn the handwheel (2) counterclockwise to retract the actuator stem as far as it will go.

Place the actuator on the valve connection and tighten coupling nut (4) (tightening torque 20 Nm).

3.1 Mounting position

The control valve can be installed in the pipeline in any desired position. However, a suspended mounting position of the actuator is not permissible (see Fig. 3).



2 Handwheel
3 Actuator stem
4 Coupling nut

Fig. 2: *Attaching actuator and valve*

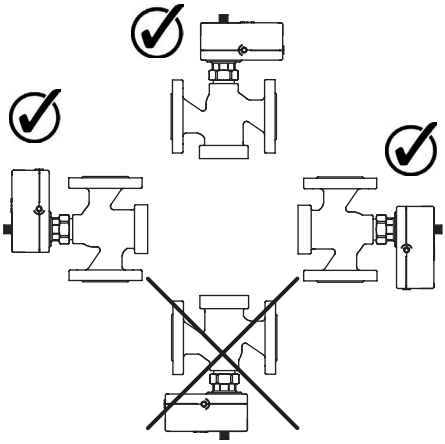


Fig. 3: *Mounting position*

4 Electrical connection

DANGER!
Risk of electric shock
For electrical installation, observe the relevant electrotechnical regulations concerning low-voltage installations according to DIN VDE 0100 as well as the regulations of your local power supplier and the accident prevention regulations that apply in the country of use.

– *Only use a suitable power supply which guarantees that no dangerous voltages reach the device in normal operation and in the event of a fault in the system or any other system parts.*
– *Connect the actuator to the electrical network only after the power supply is first switched off. Make sure the power cannot be switched on unintentionally.*

Three-step version

➔ Connect the wiring as shown in Fig. 4.

➔ The interference suppression capacitors Ce in the output circuit of the connected controller must not exceed a value of 2.5 nF to ensure the proper functioning of the actuator. A special actuator version is available on request for connection to controllers with larger interference suppression capacitors.

The control signals of the controller are connected to the terminals **eL** and **aL**. If voltage is applied to **eL**, the actuator motor retracts the actuator stem.

If voltage is applied to **aL**, the actuator motor extends the actuator stem.

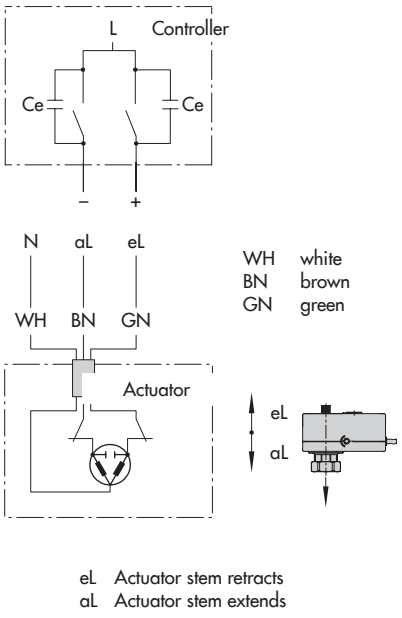


Fig. 4: *Wiring diagram – Three-step version*

Version with digital positioner

➔ Connect the six-wire connecting cable as shown in Fig. 5.

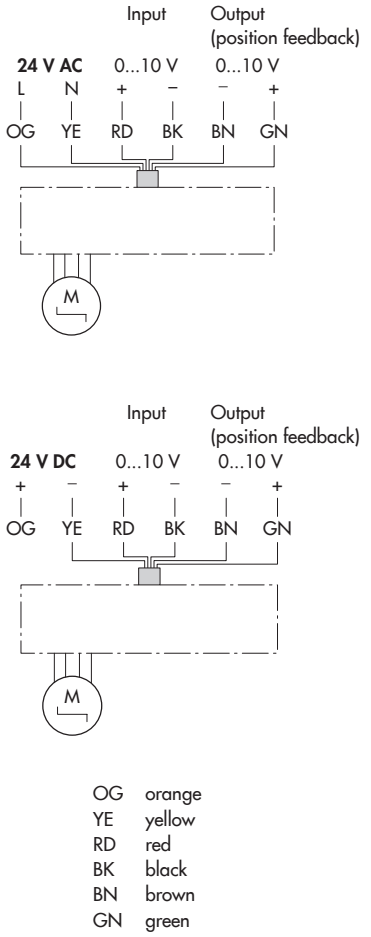


Fig. 5: *Wiring diagram – Version with digital positioner*

5 Start-up

Three-step version

1. Mount the actuator onto the valve as described in section 3.
2. Connect the wiring as shown in Fig. 4.

Version with digital positioner

1. Mount the actuator onto the valve as described in section 3.
2. Connect the wiring as shown in Fig. 5.
3. Initialize the actuator (see section 8.1.4).
4. Configure the actuator with TROVIS-VIEW (see section 9).

6 Manual override

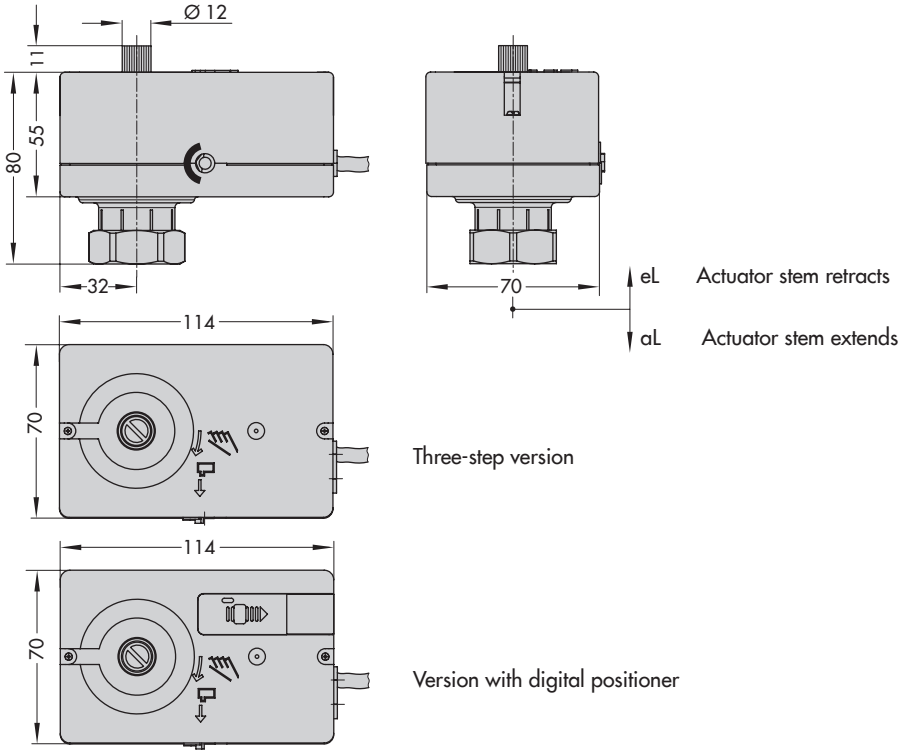
In the de-energized state, the actuator stem can be moved by the manual override.

The handwheel is used to move the actuator stem (see Fig. 6).

Direction	Actuator stem
↻	Extends
↺	Retracts

Fig. 6: *Handwheel*

7 Dimensions in mm



8 Actuator with digital positioner

8.1 Operating elements

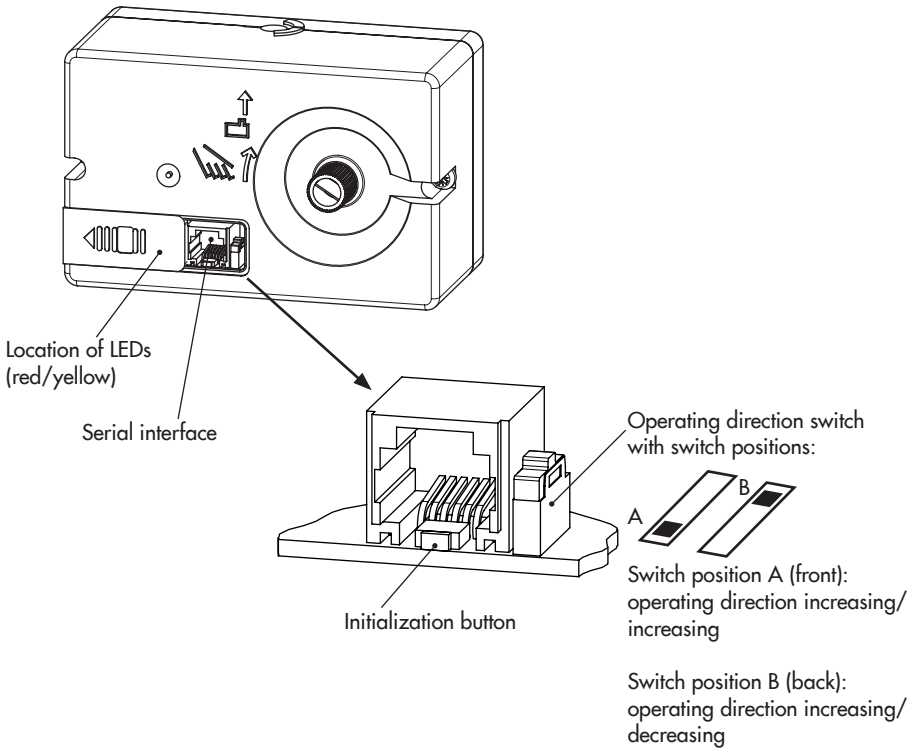
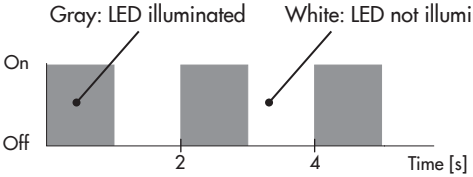


Fig. 7: *Location of operating elements*

8.1.1 LED blinking pattern

The actuator has a red and a yellow LED which indicate the operating state of the actuator. The LEDs are located underneath the cover on top of the actuator.

Explanations to the blinking pattern of the LEDs



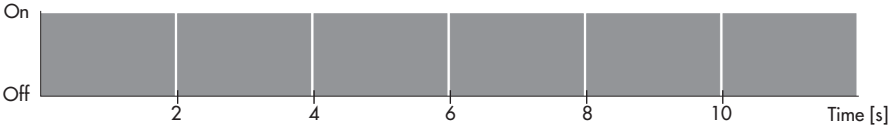
The state of the corresponding LED (on/off) is shown over time.

Blinking pattern of the yellow LED

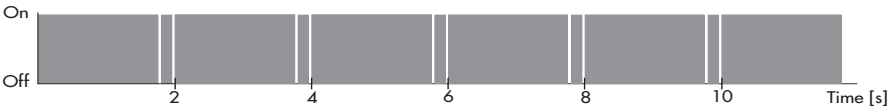
– Device off, no communication or memory pen not inserted

– Device switched on, communication in progress or memory pen action completed (see section 10.2.2)

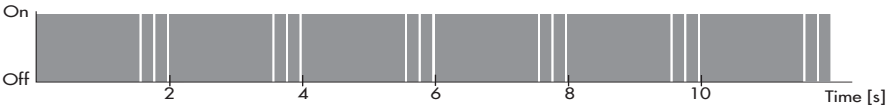
– Stem position is relative (see section 9.6.3)



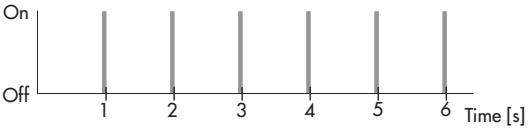
– Blocking protection active (see section 9.6.2) or data logging to memory pen (see section 10.2.4)



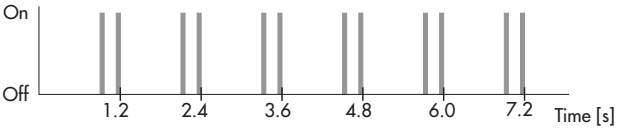
– Removing blockage (see section 9.6.2)



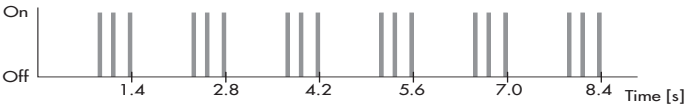
– Preparing data transmission from the memory pen (see section 10.2.2)



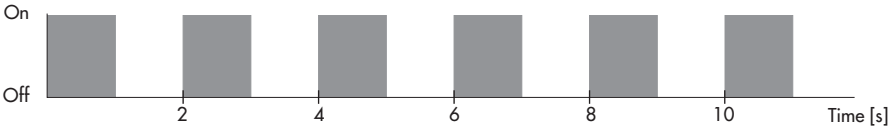
– Preparing data transmission to the memory pen (see section 10.2.2)



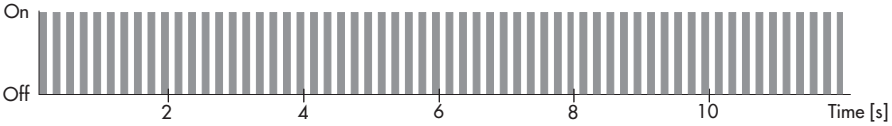
– Preparing data logging to the memory pen (see section 10.2.4)



– Plausibility error in memory pen



– EEPROM error in memory pen

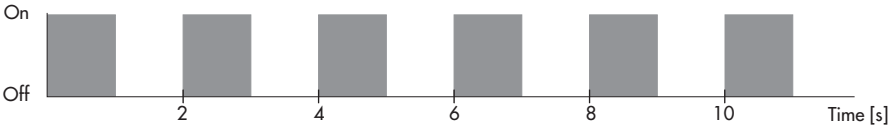


Blinking pattern of the red LED

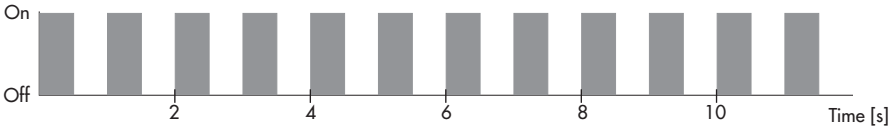
– Normal operation or memory pen inserted

– Restarting device after reset, torque-dependent limit switch error or button pressed

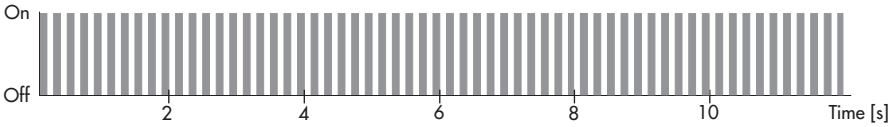
– Input signal failure recognized (see page 26)



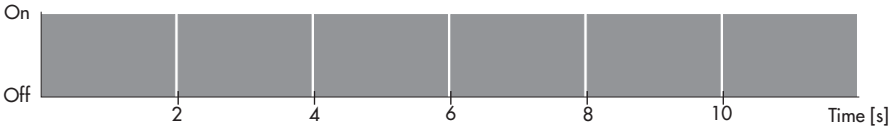
– Blockage (section 9.6.2)



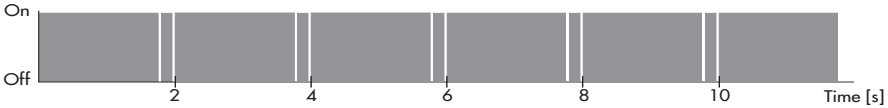
– EEPROM error



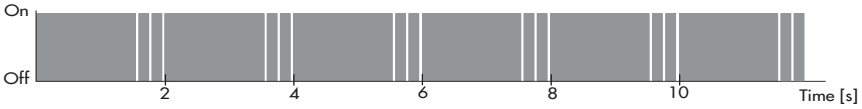
– Zero calibration in progress (see page 39)



– Transit time measurement in progress



– Initialization in progress (see section 8.1.4)



8.1.2 Operating direction switch

The position of the operating direction switch determines the actuator's direction of action.

➔ See Fig. 7

– **Switch position A:** Direction of action increasing/increasing (>>)
  The actuator stem retracts as the input signal increases.
– **Switch position B:** Direction of action increasing/decreasing (<>)
  The actuator stem extends as the input signal increases.

Actuator stem extended

– For globe valves: Valve closed
– For three-way mixing valves: Port A → AB open, B → AB closed
– For three-way diverting valves: Port AB → A closed, AB → B open

Actuator stem retracted

– For globe valves: Valve open
– For three-way mixing valves: Port A → AB closed, B → AB open
– For three-way diverting valves: Port AB → A open, AB → B closed

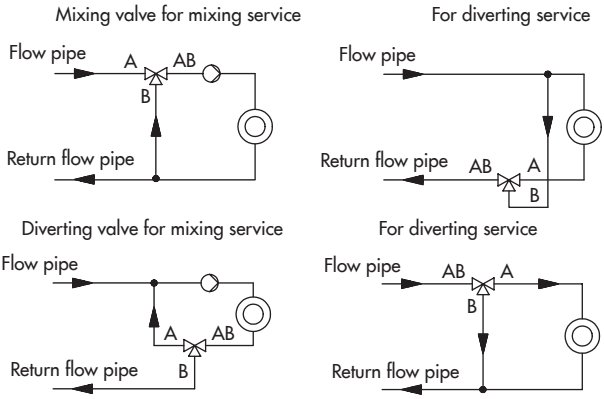


Fig. 8: *Operating principle of three-way mixing and diverting valves*

8.1.3 Initialization button

To achieve correct position feedback, the actuator must be initialized. This is also necessary after changing any settings at the actuator.

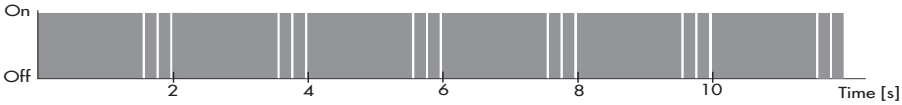
Initialization is started manually by pressing the initialization button (see section 8.1.4).

8.1.4 Starting initialization

> ***NOTICE***
> *The process is disturbed by the movement of the actuator stem.*
> *Do not perform the initialization while the process is running. First isolate the plant by closing the shut-off valves.*

1. Press the initialization button for about one second until the **red LED** is illuminated.
2. Release initialization button. Initialization starts.

   The **red LED** indicates that initialization is in progress:



8.1.5 Serial interface

TROVIS-VIEW

The actuator is configured with the TROVIS-VIEW software. In this case, the serial interface on the actuator is used to connect the actuator to the computer.

➔ Refer to section 9 for more details on configuration and operation using TROVIS-VIEW.

Memory pen

A memory pen can also be inserted at the serial interface.

➔ Refer to section 10.2 for more details on the memory pen.

9 Configuration and operation using the TROVIS-VIEW software

The following descriptions apply to **TROVIS-VIEW 4.**

Tip:
The TROVIS-VIEW software and its operating instructions ▶ EB 6661 are available for downloading from our website (www.samson.de) at Services > Software > TROVIS-VIEW. The document can also be viewed in TROVIS-VIEW ('?' menu).

9.1 General

The TROVIS-VIEW software allows users to configure and parameterize various smart SAMSON devices. It consists of the operator interface, communication server and the device-specific module. Working in TROVIS-VIEW is similar to working in Windows® Explorer. All the digital positioner settings can be changed over the TROVIS-VIEW software.

9.1.1 System requirements

Hardware

- PC with Pentium processor or equivalent (1 GHz or faster), at least 512 MB RAM
- RS-232 serial interface or USB port (using a USB/RS-232 adapter) and suitable hardware depending on the SAMSON device used
- 1 GB hard drive space for x86 and 2 GB hard drive space for x64 (including space to install Microsoft® .NET Framework 4.0)

Software

- Operating system: Windows® XP (SP3), Windows® Vista (SP1), Windows® 7, Windows® 8 and 8.1 (only up Windows® 7 when used in conjunction with USB drivers for isolated USB interface adapters or SAMSON USB devices). Administrator rights are required to install the software.
- Microsoft® .NET Framework 4.0 (client profile)
- PDF reader

9.2 Installing the software

1. Start the installation from the *setup.exe*.

Note:
– Installation from a downloaded file: Unzip the ZIP file on your system before starting the installation.
– Installation from a CD-ROM: Once inserted, the CD-ROM starts the installation program automatically, depending on the configuration of the operating system. You do not need to run the setup.exe.

---

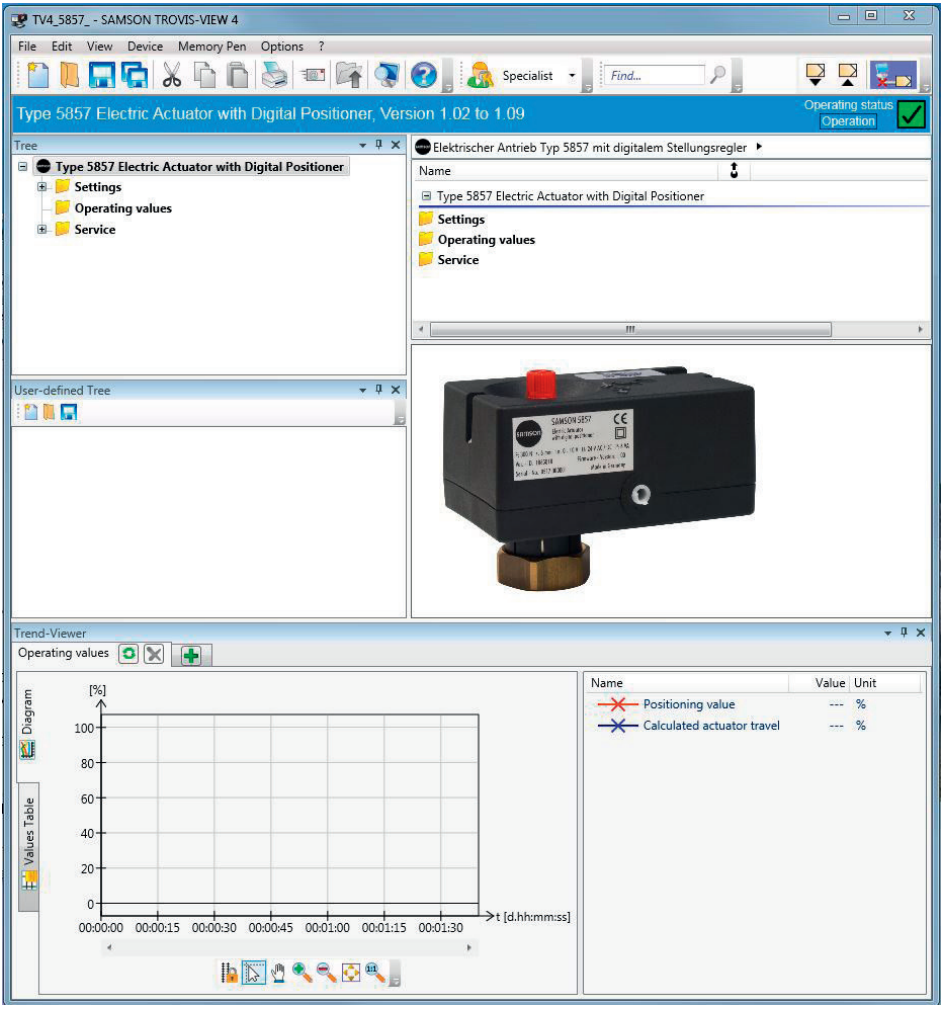
2. Follow the on-screen prompts and instructions of the installation program.

9.3 Starting and setting the software

Settings can be made in the TROVIS-VIEW software regardless of whether the actuator is connected to the computer or not.

Note:
When the device is not connected (offline mode), the default settings appear on the operator interface or, alternatively, a stored TROVIS-VIEW file (.tro) can be loaded and overwritten by selecting* Open *from the* File *menu.*

After starting TROVIS-VIEW, the following screen appears:



You can read the following information on this screen:

Online mode: The icon is animated in online mode (see section 10.1.2).

Offline mode: the offline icon appears (see section 10.1.1).

Operating status: The operating status is indicated on the right-hand side of the status bar:

Operating status	Icon
Operation	
Alarm	

9.4 Setting parameters in TROVIS-VIEW

9.4.1 Changing settings

Functions

Double-click on a function to activate (yes) or deactivate (no) it. Right-click it to open a context-sensitive menu that includes the following options:

Edit	Parameters can be changed.
Read	Parameters can be uploaded from the device (only in offline mode, see section 10.1.1).
Write	Parameters can be downloaded to the device (only in offline mode, see section 10.1.1).
Default: ...	Parameters can be reset to their default values.

Parameters

Double-click the required parameter value to open a window to change the parameter.

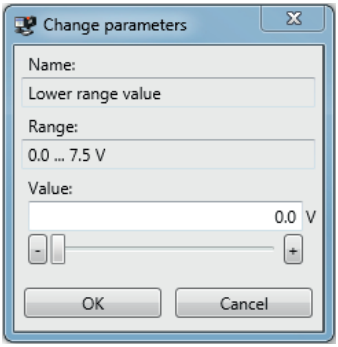


Fig. 9: *Parameters (example): lower range for input signal range*

Right-click it to open a context-sensitive menu that includes the following options:

Edit	Open *Change parameters* window.
Read	Uploads the parameter value from the device. Only displayed in offline mode (see section 10.1.1).
Write	Downloads the parameter value to the device. Only displayed in offline mode (see section 10.1.1).
Default: ...	Resets parameter to default setting (setting in gray to indicate that the parameter value is the same as the default setting)
Min ...	Resets parameter to minimum value as shown (setting in gray to indicate that the parameter value is the same as the minimum value).
Max ...	Resets parameter to maximum value as shown (setting in gray to indicate that the parameter value is the same as the maximum value).

9.5 Inputs and outputs

9.5.1 Input signal

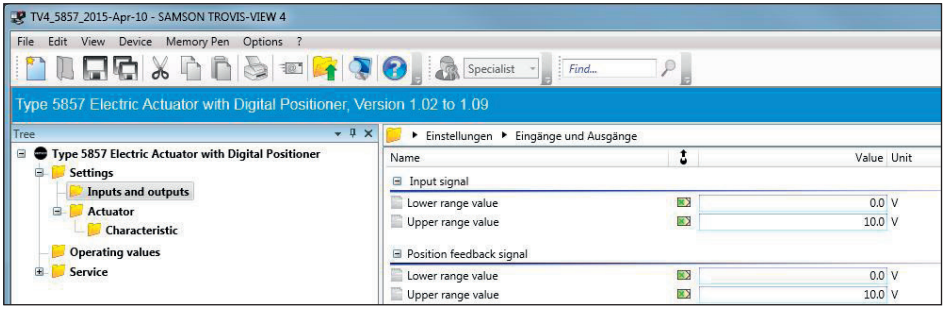
The input signal determines the actuator stem position.

The default values for the lower range and upper range of the input signal are between 0 and 10 V. The input signal range can be adapted as required, e.g. to achieve a plant operation characteristic by connecting two or more actuators in parallel (split-range operation).

Example: Two valves regulate the process medium in one common pipeline to achieve a large rangeability. One valve opens with a 0 to 5 V input signal, while the second valve also opens when the input signal increases further (5 to 10 V) and the first valve remains open. The two valves close in the reverse order.

Note:
At least 2.5 V must separate the upper and lower range values (depending on the input signal and position feedback signal used).

➔ Click *Settings* folder *(Inputs and outputs)*.
The settings for the input signal and position feedback signal are shown:



Set input signal: *Settings\Inputs and outputs\Input signal*

Input signal	Default	Adjustment range
Lower range value	0.0 V	0.0 to 7.5 V
Upper range value	10.0 V	2.5 to 10.0 V

9.5.2 Position feedback signal

The position feedback indicates the position of the actuator stem.

The span of the position feedback signal is adjusted over the *lower and upper range value* parameters.

Set position feedback signal: *Settings\Inputs and outputs\Position feedback signal*

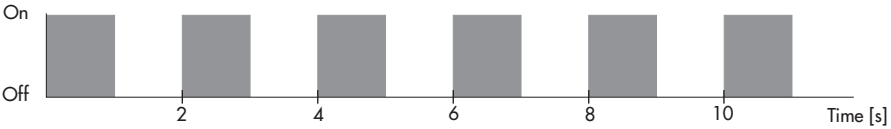
Position feedback signal	Default	Adjustment range
Lower range value	0.0 V	0.0 V to 10.0 V
Upper range value	10.0 V	0.0 V to 10.0 V

9.6 Actuator

9.6.1 Functions (actuator)

Detect input signal failure

The positioner detects a failure of the input signal as soon as the value falls below the lower range value by 0.3 V when the *Detect input signal failure function* is active. An input signal failure is indicated in the *Service* folder (*Statistics)* as well as by the **red LED**:



Note:
The input signal failure can only be detected when at least 0.5 V is set as the lower range value.

If the **Detect input signal failure** function is active, the reaction of the actuator upon failure of the input signal is determined by the *Positioning value upon input signal failure* parameter.

– *Positioning value upon input signal failure* = Internal
  The actuator stem moves to the position specified in the *Internal positioning value* parameter upon failure of the input signal.
– *Positioning value upon input signal failure* = Last position
  The actuator stem remains in the last position that the valve moved to before failure of the input signal.

The error message is reset and the actuator returns to closed-loop operation if the input signal moves within 0.2 V of the lower range value.

Input signal failure settings: *Settings\Actuator\Functions*

Functions	Default	Adjustment range
Detect input signal failure	No	Yes/No
Positioning value upon input signal failure	Internal	Internal, last position
Internal positioning value	0.0 %	0.0 to 100.0 %

End position guiding

The actuator stem moves to the end positions early if the end position guiding function is active:

– End position guiding (stem extends)
  The actuator stem moves the valve to the closed position when the input signal reaches the value *End position guiding (stem extends)*.
– End position guiding (stem retracts)
  The actuator stem moves the valve to the fully open position when the input signal reaches the value *End position guiding (stem retracts)*.

Note:
When 'End position guiding (stem extends)' = 0 % and 'End position guiding (stem retracts)' = 100 %, the end positioning guiding function is deactivated.

End position guiding settings: *Settings\Actuator\Functions*

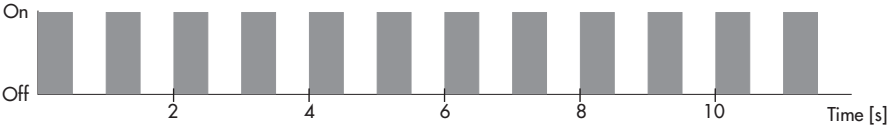
Functions	Default	Adjustment range
End position guiding (stem extends)	1.0 %	0.0 to 49.9 %
End position guiding (stem retracts)	97.0 %	50.0 to 100.0 %

9.6.2 Blockage

Blockage detection

Note:
*The positioner can only detect a valve blockage after either an initialization (section 8.1.4) or a transit time measurement (*Service *folder in* Start-up *or* Functions*) has been performed after the actuator is started up for the first time.*

The positioner detects a valve blockage **when the actuator stem extends** and with **absolute travel adjustment** by comparing the travel after the limit switch has been triggered with the travel measured on initialization. If the comparison shows that the limit switch was triggered too early, this indicates that there is a valve blockage. The **red LED** blinks.

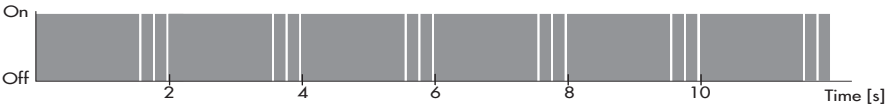


Blocking detection settings: Settings\Actuator\Blockage

Function	Default	Adjustment range
Blockage detection	No	Yes, No

Blockage removal

When the **Blockage removal** function is active, the actuator stem extends and retracts 1 mm at the adjusted stroking speed three times in sequence. The action is indicated by the **yellow LED**:



Blocking removal settings: *Settings\Actuator\Blockage*

Function	Default	Adjustment range
Blockage removal	No	Yes, No

Indicate blockage

The positioner indicates a blockage when the **Indicate blockage** function is active.

– A 12 V signal is issued at the output.

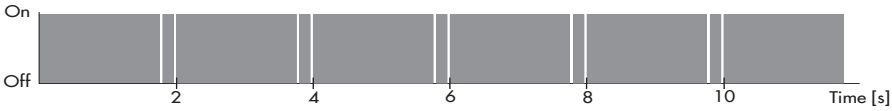
Indicate blockakage settings: *Settings\Actuator\Blockage*

Function	Default	Adjustment range
Indicate blockage	No	Yes, No

Blocking protection

The blocking protection prevents the valve from seizing up. If the actuator stem is in the closed position (0 %), it is extended slightly and then moved back to the closed position 24 hours after it last moved.

Movement of the actuator stem caused by the activated blocking protection is indicated by the **yellow LED**:



Blocking protection settings: *Settings\Actuator\Blockage*

Function	Default	Adjustment range
Blocking protection	No	Yes/No

9.6.3 Travel

The *Limited travel range* parameter determines in % how far the actuator stem can move at the maximum. The travel determined during initialization acts as the reference.

Settings of the limited travel range: *Settings\Actuator\Travel*

Function	Default	Adjustment range
Limited travel range	100.0 %	30.0 to 100.0 %

Travel adjustment

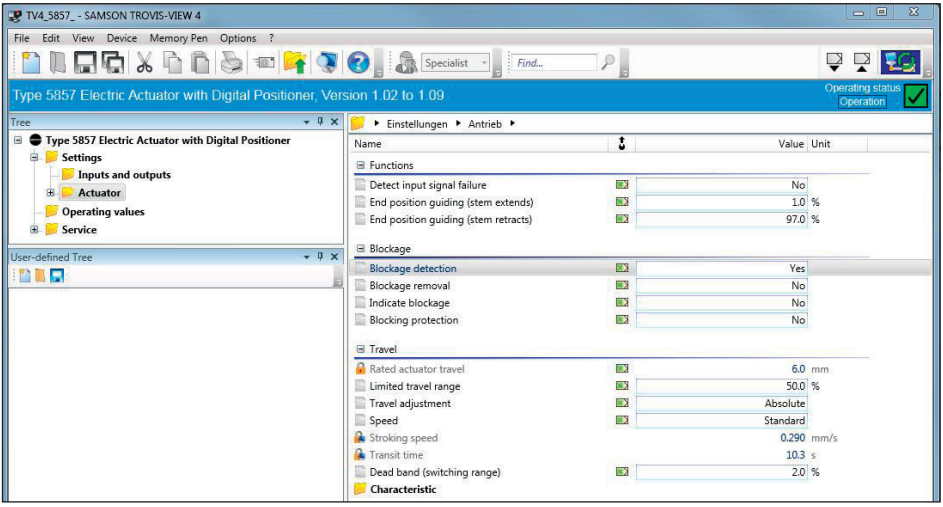
Travel adjustment can be made to be absolute or relative. The way the travel adjustment is made affects the control behavior.

– **Absolute travel adjustment:**
  The absolute travel adjustment causes the actuator stem to move to the travel position determined by the input signal. To achieve this, an automatic zero calibration is performed after every start-up to obtain a reference value for the zero point. The position feedback indicates the position of the actuator stem.
– **Relative travel adjustment**
  The relative travel adjustment causes the change in input signal to be reproduced by the position of the actuator stem. The actuator stem extends or retracts from the current actuator stem position corresponding to the change in signal. After starting up the actuator, a zero calibration is not performed. The stem position is unknown on reconnection after power failure. The input signal is assigned in this case as the start value. 12 V is issued as the position feedback signal. When, during operation, the actuator stem reaches the travel stop for "stem extends" and, at the same time, the input signal is 0 %, the stem position is recognized as a result.

Setting the travel adjustment

In closed-loop operation, the actuator's positioner must be operated with absolute travel adjustment (default setting).

Change the travel adjustment in the *Settings* folder (*Actuator/Travel*).



Note:
The further description refers to the operation with absolute travel adjustment, unless specified otherwise.

Speed

The actuator stem moves to the position determined by the input signal at the selected stroking speed. There are three speed levels:

– Slow = 0.2 mm/s
– Standard = 0.3 mm/s
– Fast = 0.55 mm/s

Speed settings: *Settings\Actuator\Travel*

Function	Default	Adjustment range
Speed	Standard	Slow, Standard, Fast

Note:
The transit time is calculated from the travel and the stroking speed. The transit time is the time that the actuator stem needs to move through the adjusted travel.

The following applies: $\textit{Transit time [s]} = \frac{\text{Travel [mm]}}{\text{Stroking speed [mm/s]}}$

Dead band (switching range)

The dead band determines how sensitive the actuator reacts. A change in the input signal by the hysteresis first causes a minimally small change in the valve position.

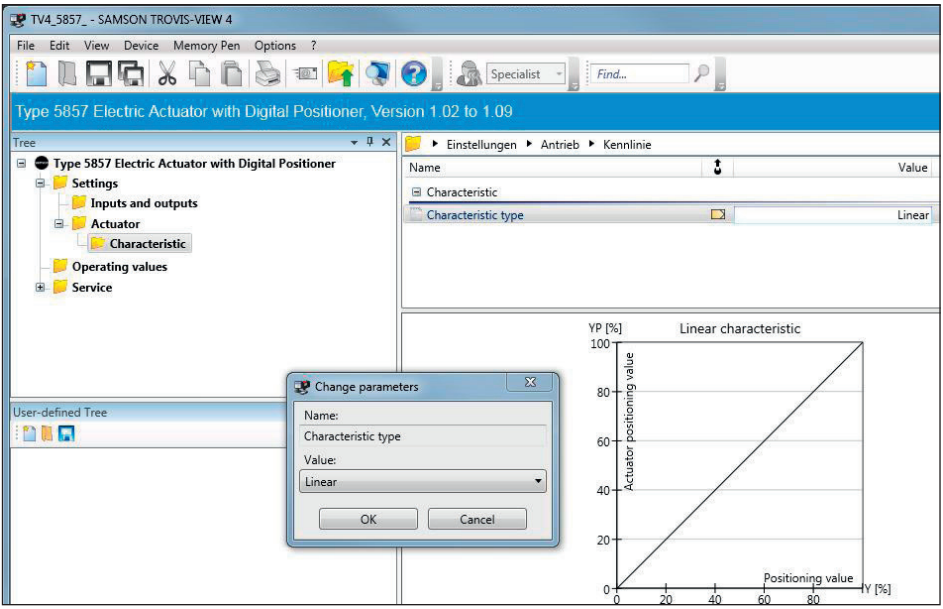
Dead band settings: *Settings\Actuator\Travel*

Function	Default	Adjustment range
Dead band (switching range)	2.0 %	0.5 to 5.0 %

9.6.4 Characteristic

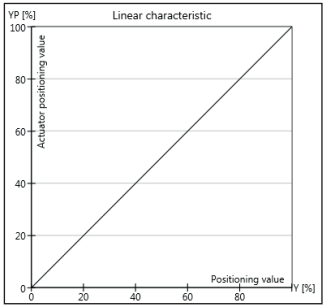
The characteristic expresses the relation between the input signal and the actuator stem position.

Perform the characteristic settings in the *Settings* folder (*Actuator\Characteristic)*:

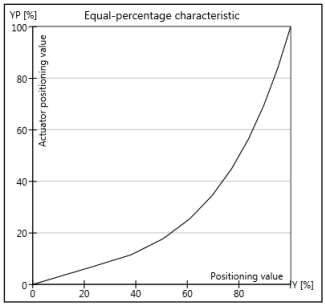


Characteristic types

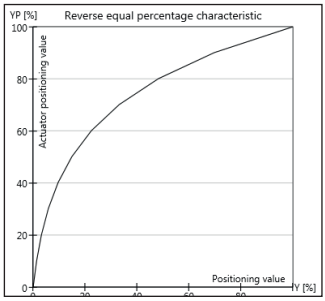
– **Linear**
The travel is proportional to the input signal.



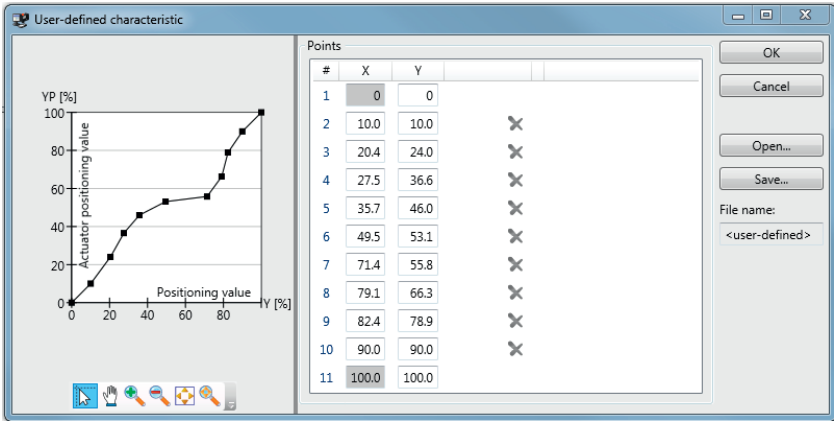
– **Equal percentage**
The travel is exponential to the input signal.



– **Reverse equal percentage**
The travel is reverse exponential to the input signal.



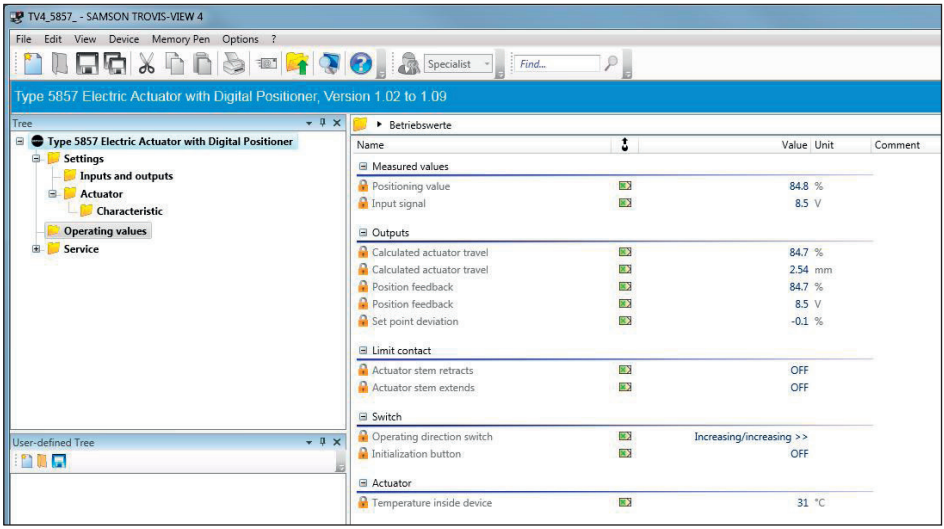
– **User-defined**
A new characteristic based on the characteristic set can be defined over eleven points.



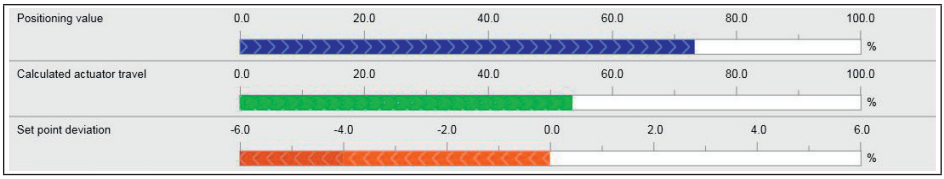
9.7 Operating values

Note:
The values in Operating values *folder cannot be changed.*

In **online mode** (animated icon) the current operating values are listed in the *Operating values* folder.



Depending on the basic setting, operating values are plotted in a graph underneath.



9.8 Service

The *Service* folder is subdivided into the areas Start-up, Operating states, Functions, Status messages and Statistics.

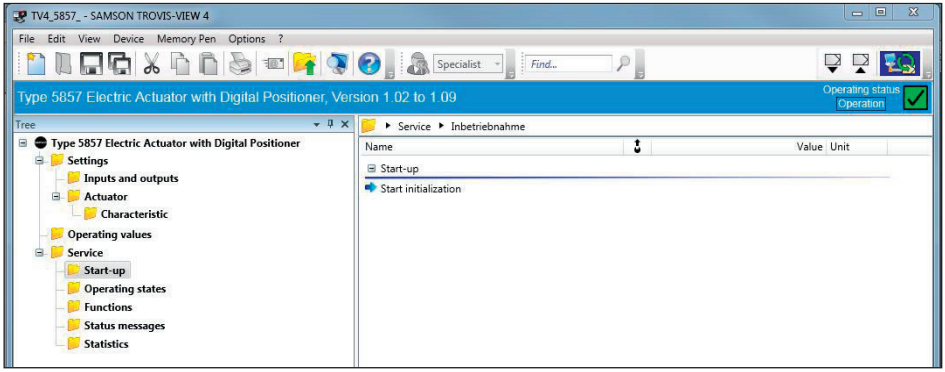
9.8.1 Start-up

Initialization can be started in the *Service* folder (*Start-up*).

! ***NOTICE***

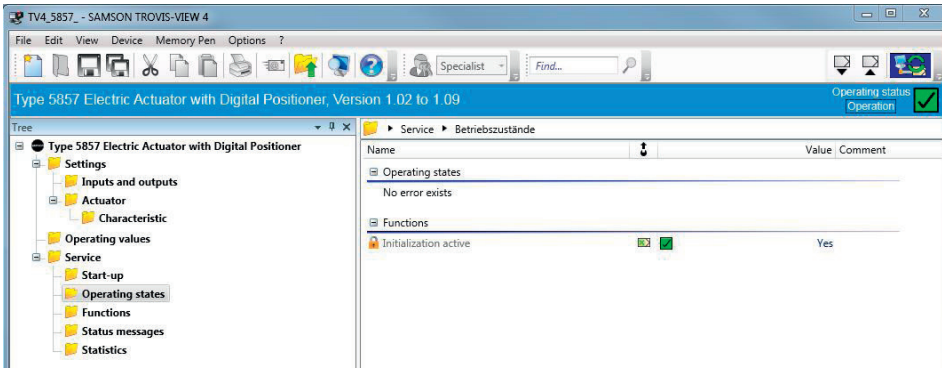
The process is disturbed by the movement of the actuator stem.
Do not perform the initialization while the process is running. First isolate the plant by closing the shut-off valves.

➔ Double-click *Start initialization*.



9.8.2 Operating states

Error messages can be read in the *Service* folder (*Operating states*).

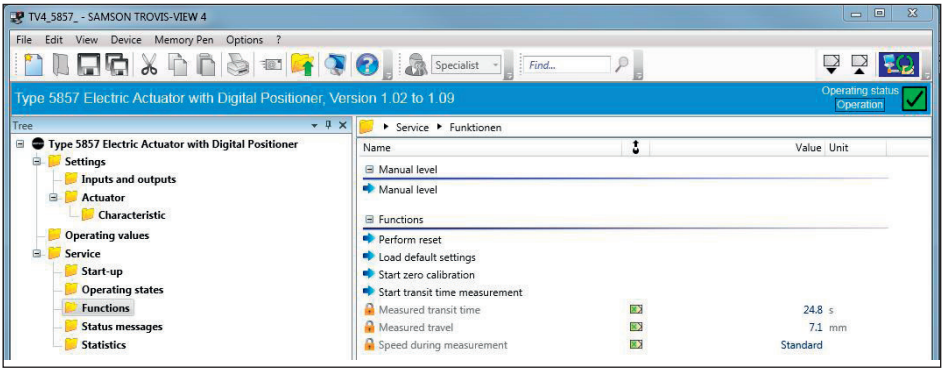


Note:
Operating states and errors are also indicated by the LEDs using different blinking patterns (see section 8.1.1).

9.8.3 Service/Functions

Manual level

The manual level allows direct control of the actuator. It must be enabled in the *Service folder (Functions)*.

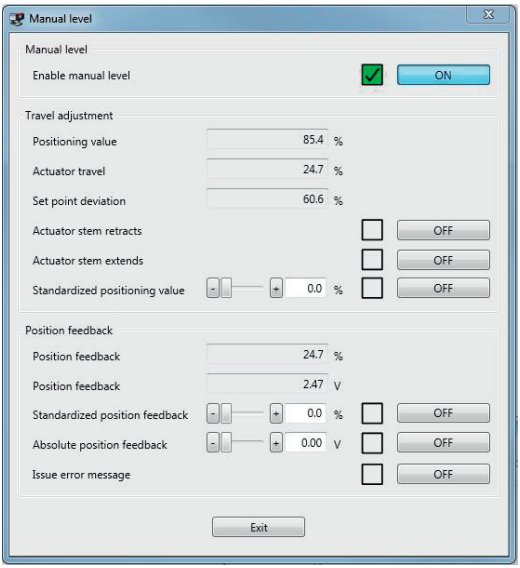


Enable the manual level

1. Select the manual level in the *Service folder (Functions)*.

➔ A window opens.

2. Enable the manual level by clicking ON.



> ***Note:***
> *The actuator leaves the manual mode as soon as you exit the manual level or the online mode in TROVIS-VIEW.*

The individual functions can be activated or deactivated by selecting ON/OFF. The following functions are available:

- **Actuator stem retracts:**
  The actuator stem moves to the top end position when the function is activated.
- **Actuator stem extends:**
  The actuator stem moves to the bottom end position when the function is activated.
- **Standardized positioning value:**
  The actuator stem moves to the position defined by the entered value when the function is activated. The value is based on the input signal range.
- **Standardized position feedback:**
  The adjusted value is represented at the signal output as a voltage when the function is activated. It is based on the adjusted range of the position feedback signal.
- **Absolute position feedback:**
  The adjusted voltage represents the position feedback signal at the output when the function is activated.
- **Issue error message:**
  A 12 V voltage signal issued as a position feedback signal when the function is activated.

Further service functions

Perform reset

The actuator is restarted.

Load default settings

The configuration is reset to the default setting.

Start zero calibration

The actuator moves to the end position (stem extended). After the zero calibration is completed, the transit time is adopted and the actuator is ready for operation. The actuator stem is moved to the position determined by the input signal.

Start transit time measurement

Measures the time required to move from one end position to the other.

Long-term test/Basic settings

➔ For after-sales service only

! ***NOTICE***

The process is disturbed by the movement of the actuator stem.
Do not perform the long-term test while the process is running. First isolate the plant by closing the shut-off valves.

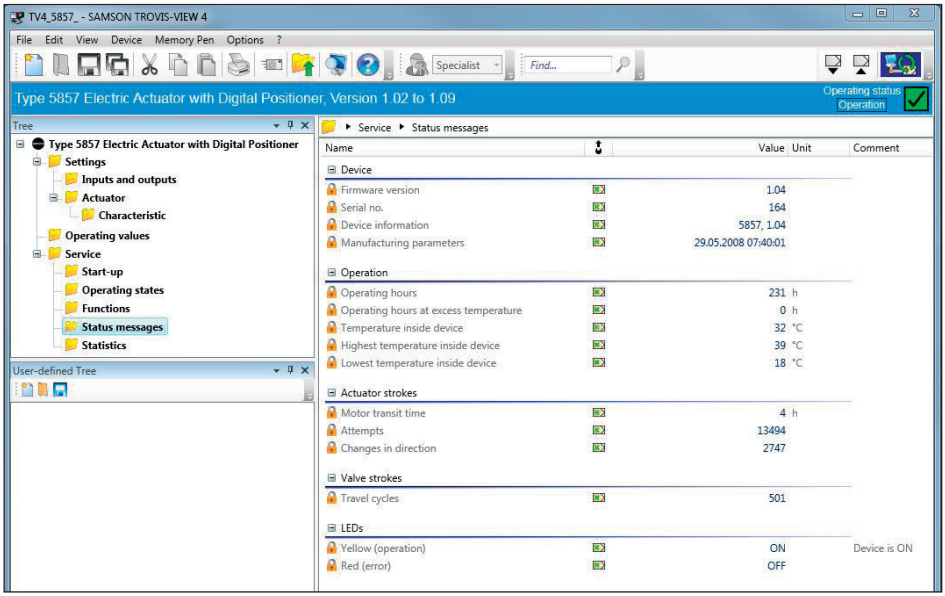
After activating the long-term test, the actuator moves continuously within a range between two adjustable stem positions (Position 1, Position 2). Additionally, a waiting time between changes in direction can be adjusted.

➔ Only perform the long-term test for servicing purposes and only under supervision.

➔ Incorrect performance of the long-term test with a continuously moving actuator stem may damage the actuator.

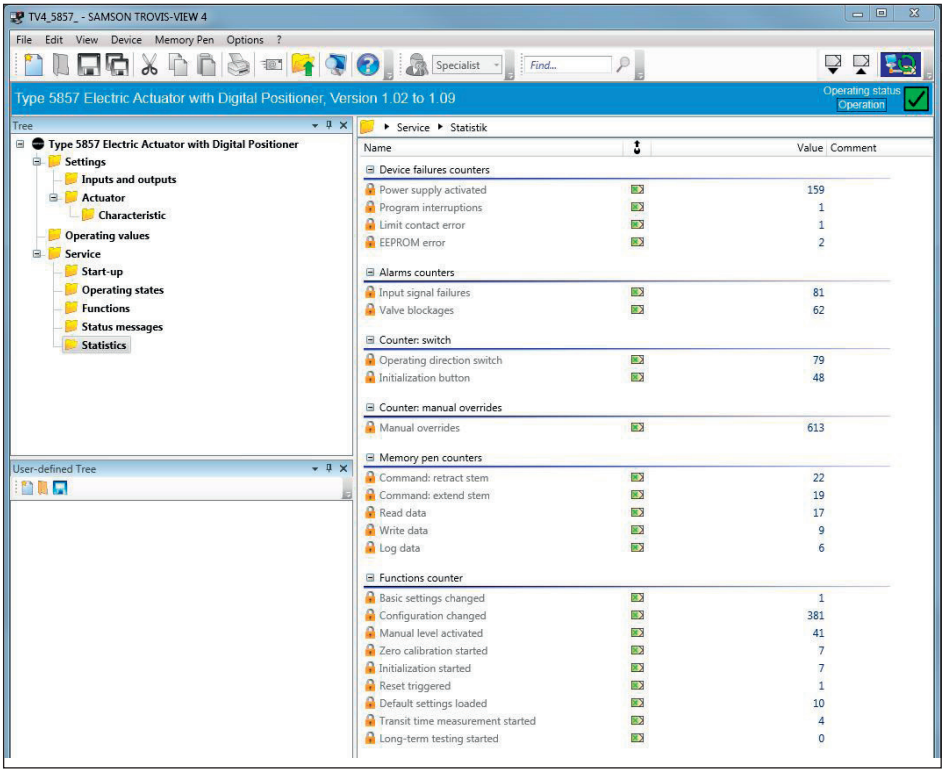
9.8.4 Status messages

In the *Service* folder (*Status messages)*, device and operation parameters are shown.

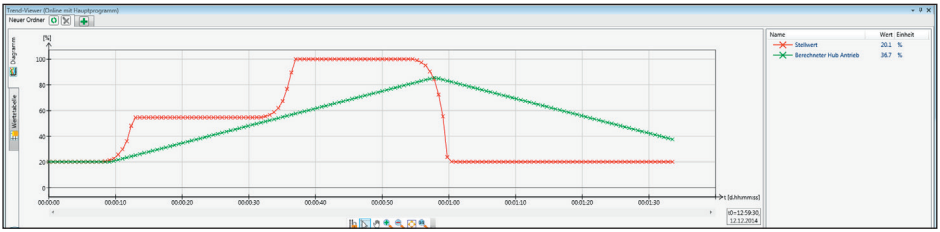


9.8.5 Statistics

In the *Service* folder (*Statistics)*, the number of different events is shown:



9.9 Trend-Viewer



The Trend-Viewer is only displayed when the Trend-Viewer is checked in the *View* menu. All data of the activated list of parameters are uploaded cyclically from the actuator in online mode when the Trend-Viewer is activated.

The graph can be adapted. Various operating values can be displayed if their parameter box are checked.

In addition to the selection of data points, the x axis and y axis can be shifted and the scale can be adapted. You can also zoom in and out of the graph.

9.9.1 Settings

New data points can be added by dragging and dropping them into the Trend-Viewer window. To do this, click on the required data point in the folder and drag it into the Trend-Viewer. You can change the data point name, range of values, time axis or color by double-clicking or right-clicking on the data point.

Select *Online Mode* from the *Device* menu to establish communication and display the selected data points in the Trend-Viewer according to the settings previously made.

Apart from merely displaying and the exporting the logged data, it is also possible to save the logged data points cyclically in a file. Right-click on the graph and select *Save logging automatically* from the context-sensitive menu to choose a location where the logging is to be saved.

Select *Modify storage address for logging...* from the context-sensitive menu to change this storage location.

The logging is automatically saved every five minutes after the online mode is started in a file named using the date, time and module type with the .”log” affix (e.g. *Date–Time–Module type.log*) as well as when exiting the online mode. This file can be edited as required.

Tip:
Further information can be found in the operating instructions ▶ EB 6661 on our website (www.samson.de) at Services > Software > TROVIS-VIEW. The document can also be viewed in TROVIS-VIEW ('?' menu).

10 Data transmission

The TROVIS-VIEW software can either be used in offline mode (device not connected to the computer) or in online mode (device connected to the computer). To activate online mode, click the icon. The communication port must be set (see section 10.1).

Online mode (direct data transmission): The device and TROVIS-VIEW are connected constantly. Current configuration and operating data are uploaded from the device cyclically and displayed in TROVIS-VIEW. The settings configured in TROVIS-VIEW can be directly transferred to the device.

To enable communication with the computer, a computer's serial interface (COM port) is connected to the serial interface of the device using a SAMSON connecting cable. In case the computer does not have a COM port, a USB/RS-232 adapter can be used.

Offline mode (indirect data transmission): There is no constant data communication between the computer and device. Communication must first be established to upload from the device or download data to the device.

Data can be transferred to the serial interface using the SAMSON connecting cable or a memory pen together with a modular adapter. A memory pen allows you to simply copy data onto other devices.

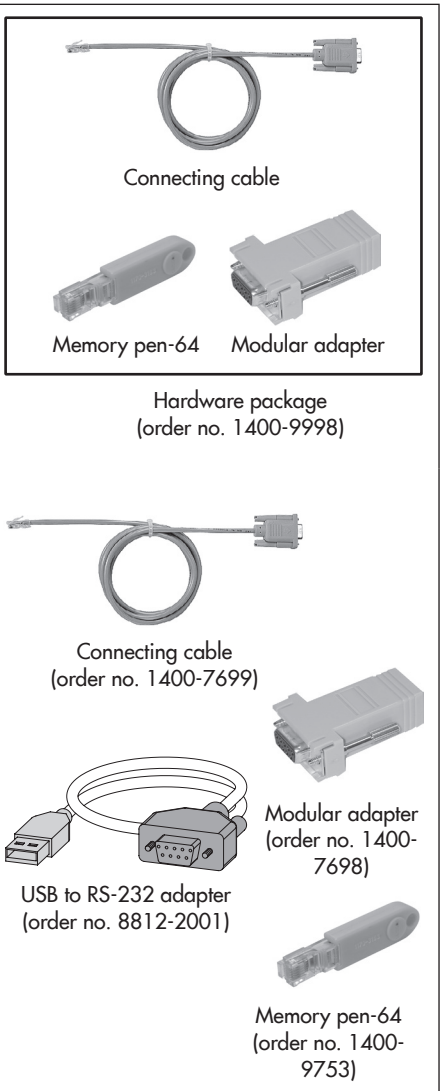
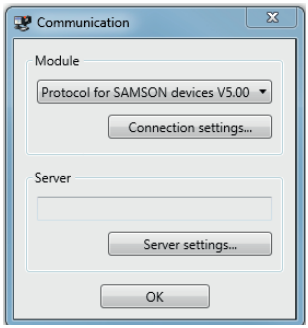


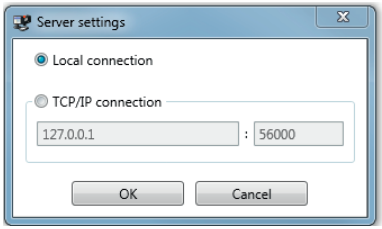
Fig. 10: *Accessories for data transmission*

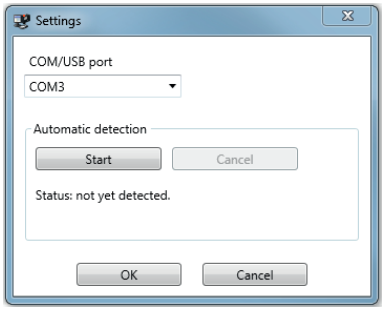
10.1 Data transmission between TROVIS-VIEW and the actuator (connecting cable)

Note:
Data transmission is only possible after electrical connection (see section 4) and when the actuator is ready to run.

1. Connect the serial port of the computer using the connecting cable to the serial interface of the actuator.
2. Select *Communication ...* from the *Options* menu to open the *Communication* window. Click *Server settings*.
3. Check *Local connection* radio button. Click *OK*. The *Communication* window reappears.
4. Click *Connection settings*.
5. In the Automatic detection field (Status: not yet detected), click *Start*. TROVIS-VIEW has found the device when the status changes (Device found on COM ....). Click *OK* twice to confirm settings.







10.1.1 **Offline mode** (indirect data transmission)

In offline mode, there is no constant data communication between the computer and actuator. Communication must first be established to upload from the device or download data to the device.

Writing data to the device:
Select *Write* from the *Device* menu to start data transmission.
The control task is implemented after data are downloaded from TROVIS-VIEW

Reading data from the device:
Select *Read* from the *Device* menu to start data transmission.
Uploaded data are marked in TROVIS-VIEW with the icon.

Tip:
Data transmission can also be performed by clicking the icons in the device toolbar:
Write data from TROVIS-VIEW to the device.
Read data from the device to TROVIS-VIEW.

10.1.2 **Online mode** (direct data transmission)

In online mode, communication is established permanently between the device and TROVIS-VIEW. All the configuration and operating data are transferred cyclically from the device and displayed in TROVIS-VIEW. The settings configured in TROVIS-VIEW can be directly transferred to the device.

Start online mode:
Select *Online Mode* from the *Device* menu.
The icon on the online toolbar is animated.

Exit online mode:
Select *Online Mode* from the *Device* menu while the online mode is activated.
The online mode is deactivated.

Tip:
Alternatively, click *on the device toolbar to activate and click* *to deactivate online mode.*

10.2 SAMSON memory pen

The memory pen can be loaded with data configured in TROVIS-VIEW and the configuration data transferred to one or several devices of the same type and version.

Additionally, the data from the device can be written to the memory pen. This allows the configuration data to be simply copied from one device and loaded onto other devices of the same type and version.

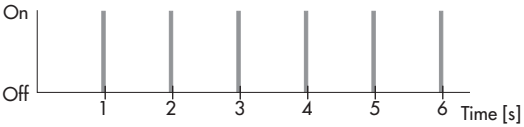
The data logging function also allows operating data to be recorded. Refer to section 10.2.4.

Note:
On inserting a memory pen that is empty or that contains data from another type of device or another version of the same device into the serial interface port of the actuator, the data from the actuator are uploaded to the memory pen regardless of the status of the memory pen and any other data on the memory pen will be overwritten.

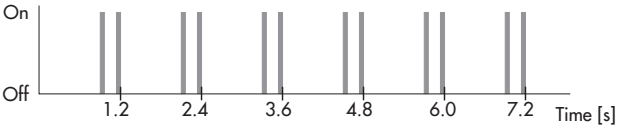
Memory pen actions and errors are indicated at the **yellow LED** on the actuator.

– Memory pen action completed

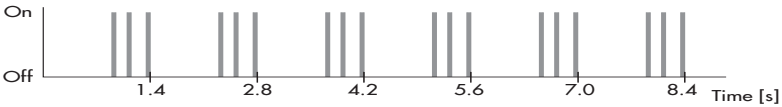
– Preparing to read data from memory pen (see section 10.2.2)



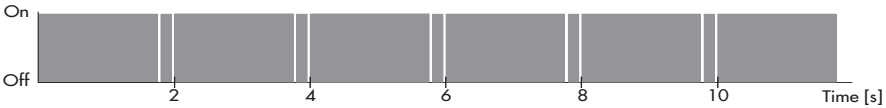
– Preparing to write data to memory pen (see section 10.2.2)



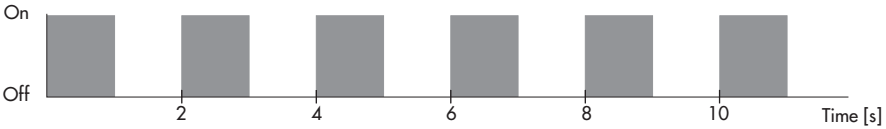
– Preparing data logging (see section 10.2.4)



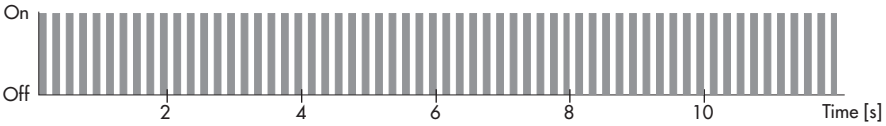
– Data logging in progress (see section 10.2.4)



– Plausibility error in memory pen



– EEPROM error in memory pen



10.2.1 Data transmission between TROVIS-VIEW and memory pen

The memory pen is connected to the computer as shown in Fig. 11. Refer to the TROVIS-VIEW operating instructions ▶ EB 6661 on how to upload and download data to the memory pen.

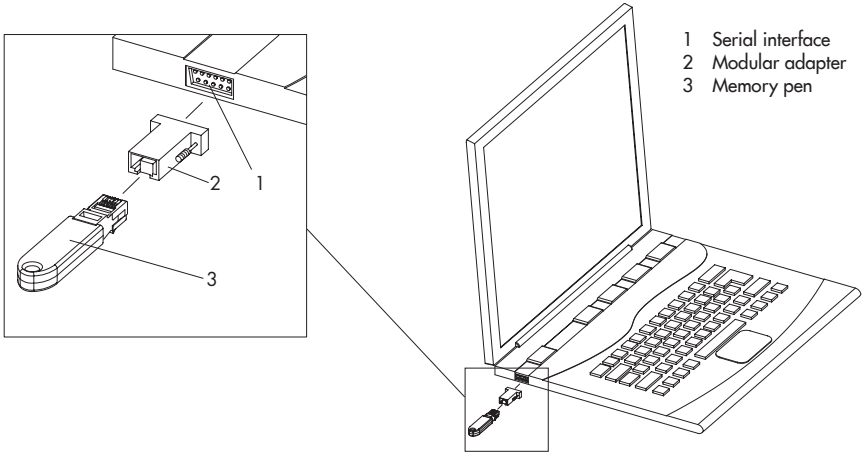
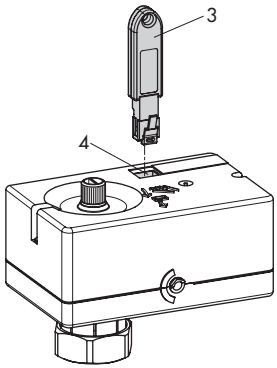


Fig. 11: *Connecting computer and memory pen*

10.2.2 Data transmission between the actuator and memory pen

The memory pen is connected to the actuator as shown in Fig. 12. Refer to the TROVIS-VIEW operating instructions ▶ EB 6661 on how to transfer data.



3 Memory pen
4 Serial interface (RJ12 jack)

Fig. 12: *Connecting actuator and memory pen*

The **yellow LED** on the actuator indicates that the data transmission is being prepared. Data transmission is completed when the **yellow LED** is illuminated continuously (see blinking patterns on page 47).

10.2.3 Copying function

The memory pen can be used to copy setting data to other Type 5857 Actuator after the data from the actuator have been transferred to the memory pen.

Note:
"Automatically write to memory pen" is reset after data are transferred from the actuator for the first time.

10.2.4 Data logging

The memory pen-64 allows the following data to be saved:

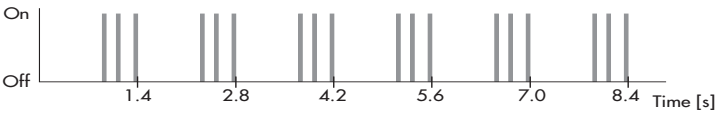
- Input [%]
- Actuator travel [%]
- Position feedback [%]
- Temperature inside device [°C]
- Torque switch: Actuator stem retracted
- Torque switch: Actuator stem extended
- Position feedback is relative
- Error during operation
- Input signal failure
- Operating direction switch
- Function switch initialization

The data are logged until the memory capacity of the memory pen is full.

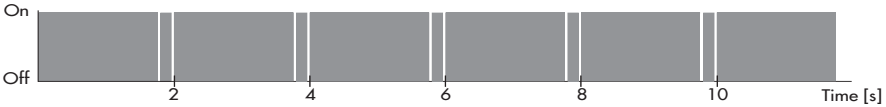
Data in the memory pen can be saved to a data logging file using the TROVIS-VIEW software.

Data logging

1. Plug the memory pen into the serial interface of the actuator (Fig. 12).
   The **yellow LED** on the actuator indicates that the data logging is being prepared.



A change in the blinking pattern of the **yellow LED** indicates that data are being saved to the memory pen.



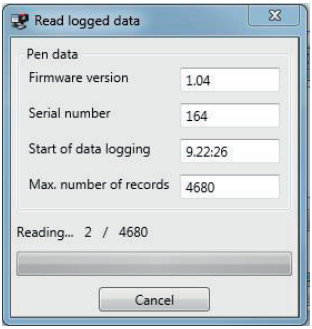
2. Data logging is completed when you remove the memory pen from the serial interface of the actuator.

Note:
You can load a data logging file into the Trend-Viewer by selecting Load diagram ... *from the context-sensitive menu.*

Transferring data onto a computer

1. Plug the memory pen (3) together with modular adapter (2) into the serial interface (COM port) of the computer (1) (Fig. 11 on page 49).
2. Select *Read Logged Data ...* from the *Memory Pen* menu.

➔ The data are read automatically. After the data have been read, the data are displayed in a window:



3. Choose target directory, enter file name and save the file.

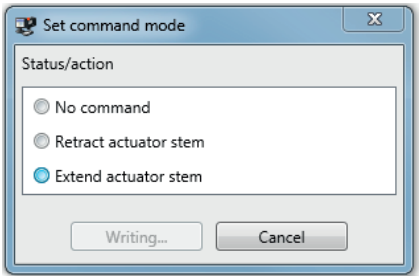
➔ The recorded data are displayed in the Trend-Viewer. Any parameters that are not used can be hidden as required.

4. The values displayed in the Trend-Viewer can also be saved:

➔ Right-click in the Trend-Viewer and select *Save diagram* from the context-sensitive menu. Choose target directory, enter file name and save the file.

10.2.5 Configuring the command mode

The actuator can be placed in the manual mode while it is in closed-loop operation using the command pen:



1. Plug the memory pen (3) together with modular adapter (2) into the serial interface (COM port) of the computer (1) (Fig. 11 on page 49).
2. Select *Set Command Mode* in the *Memory Pen* menu.
3. Set required action (e.g. *Retract actuator stem*).
4. Click *OK* to confirm.
5. Remove the memory pen from the computer and plug it into the serial interface of the actuator (Fig. 12 on page 50). The actuator stem is extended or retracted depending on which action has been selected.
6. After removing the memory pen from the actuator, the actuator returns to normal closed-loop operation.

11 Appendix

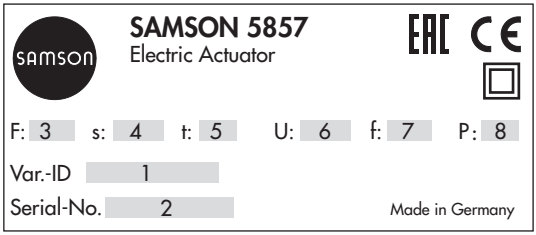
11.1 Configuration list

Note:
The configuration list only applies to actuators with digital positioner.

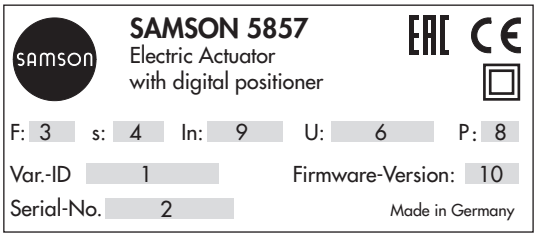
Configuration	Default setting	Adjustment range	Customer setting
Input signal			
Lower range value	0.0 V	0.0 to 7.5 V	
Upper range value	10.0 V	2.5 to 10.0 V	
Position feedback signal			
Lower range value	0.0 V	0.0 to 10.0 V	
Upper range value	10.0 V	0.0 to 10.0 V	
Functions (actuator)			
Detect input signal failure	No	Yes/No	
Positioning value upon input signal failure	Internal	Internal/Last position	
Internal positioning value	0.0 %	0.0 to 100.0 %	
End position guiding (stem extends)	1.0 %	0.0 to 49.9 %	
End position guiding (stem retracts)	97.0 %	50.0 to 100.0 %	
Functions			
Blockage detection	No	Yes/No	
Blockage removal	No	Yes/No	
Indicate blockage	No	Yes/No	
Blocking protection	No	Yes/No	
Travel			
Limited travel range	100.0 %	30.0 to 130.0 %	
Travel adjustment	Absolute	Absolute/Relative	
Speed	Standard	Slow/Standard/Fast	
Dead band (switching range)	1.0 %	0.5 to 5.0 %	
Characteristic type	Linear	Linear/Equal percentage/ Reverse equal percentage/ User-defined	

11.2 Nameplate

Three-step version



Version with digital positioner



1 Configuration ID (Var.-ID)
2 Serial no.
3 Thrust
4 Rated travel
5 Transit time for rated travel
6 Power supply
7 Rated frequency
8 Power consumption
9 Input signal
10 Firmware version

11.3 Customer inquiries

Please submit the following details:

- Type designation
- Configuration ID (Var.-ID)
- Serial no.
- Firmware version (only version with digital positioner)

Index

A

Absolute travel adjustment 30
Accessories 44
Actuator 26
  Functions 26
  Travel 29
Actuator stem 25
Attachment to the valve 8

B

Blinking pattern
  Red LED 16–17
  Yellow LED 14–16
Blockage 28
  Blockage detection 28
  Blockage removal 28
  Blocking protection 29

C

Characteristic 32
  Equal percentage 33
  Linear 33
  Reverse equal percentage 33
  User-defined 34
Command mode 53
Compliance 7
Configuration 20
Configuration list 54
Connecting cable 44–45
Copying function 51

D

Data logging 51
Data transmission 44–46
Dead band 31
Default setting 39
Digital positioner 10
Dimensions 12
Direction of action (actuator) 6

E

Electrical connection
  Three-step version 9
End position guiding 27
Errors
  Blockage 17
  EEPROM 17
  Input signal 16

H

Handwheel 8

I

Initialization
  Initialization button 13
Input signal 25
Input signal failure 26

L

LEDs 6, 14–17
Long-term test 40

M

Manual level 38
Manual override 11
Memory pen 44, 47
  Command mode 53
  Copying function 51
  Data logging 51
Message
  Blockage 17
  Data logging 15
  EEPROM error 17

Initialization button pressed 16
Initialization in progress 17
Input signal failure detected 16
Memory pen action completed 14
Plausibility error in memory pen 16
Protecting against blockage 15
Removing blockage 15
Stem position relative 14
Transit time measurement in progress 17
Zero calibration in progress 17

Mounting position 8

N

Nameplate 55

O

Offline mode 22, 46
Online mode 22, 46
Operating direction switch 13, 18
Operating elements 13
Operating states 37
Operating values 35

P

Position feedback signal 26

R

Relative travel adjustment 30
Reset 39

S

Safety instructions 5
Serial interface 6, 19
Speed 31
Start-up 10, 36
Statistics 41
Status messages 40
Switching range 31

T

Technical data 7
Transit time measurement 39
Travel 7, 29
Absolute travel adjustment 30
Relative travel adjustment 30
Trend Viewer 42
TROVIS-VIEW 20–52
Absolute travel adjustment 30
Blockage 28
Characteristic 32
Connecting cable 45
Data transmission 44–46
Default setting 39
Functions/actuator 26
Input signal 25
Input signal failure 26
Installation 21
Manual level 38
Offline mode 22, 46
Online mode 22, 46
Operating states 37
Operating values 35
Parameters 23
Position feedback signal 26
Relative travel adjustment 30
Reset 39
Settings 23
Speed 31
Start-up 36
Statistics 41
Status messages 40
Switching range 31
System requirements 20
Transit time measurement 39

Travel 29
Trend Viewer 42
Zero calibration 39

Z

Zero calibration 39

SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samson.de · www.samson.de

EB 5857 EN

2015-05-06 · English